GRAY WOLF PREY BASE ECOLOGY IN THE NORTH FORK FLATHEAD RIVER DRAINAGE

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Objectives

The overall objective of this research is to study gray wolf (Canis lupus) ungulate interrelationships in a multi-prey system. This study will focus on elk (Cervus elaphus); others will focus on white-tailed deer (Odocoileus virginianus) and moose (Alces alces). The study is being conducted in the North Fork of the Flathead River drainage, in Montana and British Columbia, Canada. Work will be concentrated on the western side of Glacier National Park, the main area of wolf recovery.

The specific objectives of the study are to determine:

1. Age and cause-specific mortality rates for elk;
2. Seasonal distribution and identification of key elk seasonal use areas;
3. Age and sex distribution/composition in the elk population;
4. Establish an index to elk abundance and distribution that may be used for long-term monitoring.

Methods

We will assess cause-specific mortality for elk by using motion-sensitive radio transmitters (i.e., mortality collars). Collapsible traps that are modifications (Sparrowe and Springer 1970, Roper et al. 1971, McCullough 1975) of the original Clover (1954) design will be used to capture elk.

Traps will be baited with second cutting alfalfa hay. We will place the traps within the territory of the Camas wolf pack in Glacier National Park, the Flathead National Forest, or southeastern British Columbia. Traps will be checked daily by mid-morning, and elk will be physically restrained after collapsing the traps.

Mortality collars will be placed on yearling and adult female elk. The collars will be an inconspicuous color (probably brown) to satisfy the concerns of Glacier National Park rangers. Collars will be monitored daily to determine whether the animal is still moving. When the signal indicates that an animal has not moved for at least 4 hours, we will carefully approach the animal on the ground (after monitoring for collared predators) and determine the cause of mortality when possible (O'Gara 1978, Wobeser and Spraker 1980). Seasonal mortality rates will be determined for yearlings and adults following Heisey and Fuller (1985). A further breakdown by age may not possible due to the small sample size.

Bear scat will be collected as in the past by McLellan, and the proportion of the scats containing elk remains will be determined. The proportion of elk remains in the diet of wolves will be determined by the Wolf Ecology Project using scat analysis from feces collected at den and rendezvous sites. Hair from calves will be identified separately from adults, and regression equations will be developed using the approach of Floyd et al. (1978) as modified by J. Weaver (pers. commun.). These regression equations will be used to estimate the proportion of calves in the diet.

Movement patterns of elk in this area are unknown. Radio-collared animals will be relocated weekly to identify key areas of seasonal use and seasonal movements. Locations will be determined from the ground whenever possible, and from an aircraft when necessary. The Universal Transverse Mercator system of recording locations will be used to ease in data retrieval and to insure that these locations can be used later on a geographic information system. Areas receiving high seasonal use, as indicated both by radio locations and by pellet counts (see below), will be identified.

Age and sex composition will be estimated when elk are aerially located during winter (Unsworth and Kuck 1988). Males continue to carry their antlers until the end of the winter and can thus be identified. Calves can be identified by size and by shape of the head. The sex and age composition of elk populations will also be estimated from road-side counts. Both elk and deer tend to concentrate along the North

Fork River in spring, making this the time when elk are most observable from the ground. This may not be a representative count of males and females but, if used for a number of years, should indicate trend. Cow-calf counts, estimted during aeiral surveys, should be representative of the population.

Pellet group counts (Neff 1968) will be used as an index to estimate relative elk abundance. Transects will be established in cooperation with the white-tailed deer project and with the moose study. L. L. Eberhardt (pers. commun.) recommended transects that are distributed systematic to monitor trend. Results from P. Tucker's thesis, conducted in the same area, will be available this summer and will provide an estimate of the sample size needed to achieve different levels of precision for white-tailed deer. She also collected information on elk pellet groups, and these data will also be available. We will use Tucker's data on variability to enable us to detect 15% population change with 95% confidence. Once these transects are in place, an index of elk abundance (along with deer and moose) can continue to be obtained after this project is complete.

Roadside counts, described above to monitor population composition, will also be used with location data to estimate population size. The number of radio collared elk seen will be used in conjunction with the number of radio collared animals in the area and the total number of elk seen to estimate population size using the Petersen Index (Caughley 1977). Because it is unlikely that large numbers of radio collared animals will be available in the future, the pellet transects will be the primary technique set up to monitor the elk population.

Results

This study was initiated on 1 October 1989; work to date has involved mostly planning and obtaining equipment and supplies. After a national search, Michael Bureau was selected to work on the study for an M.S. degree in Wildlife Biology. He has completed a draft of his thesis proposal. We have had four meetings with one or more cooperators from Glacier National Park, the U.S. Fish and Wildlife Service, the Flathead National Forest, the Montana Department of Fish, Wildlife and Parks, and the British Columbia Wildlife Branch to discuss and plan various aspects of the project, from logistics to research considerations.

Based on wolf-kill location data from 1985-present (Boyd et

al. 1989), reports from winter ranger patrols in Glacier National Park, and previous research on the winter distribution of cervids in the area (Jenkins 1985), three trapping areas have been chosen. These trap sites are located roughly in the northern, central and southern portions of the range inhabited by the wolf pack in the area. Five collapsible traps are now located at each site, and a supply of second-cut certified weed-free alfalfa hay has been stored nearby. Telemetry equipment (receiver, antennas, and "mortality collars") are on order. We will initiate trapping in early January, 1990.

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